

Simple Comparative Experiments

- 1) Define the following terms
 - a. Experiment
 - b. Explanatory variable
 - c. Response variable
 - d. Experimental condition
 - e. Extraneous variable
 - f. Direct control
 - g. Blocking
 - h. Random assignment
 - i. Replication
 - j. Lurking variables
 - k. Randomized block design
- 2) The head of the quality control department at a printing company would like to carry out an experiment to determine which of three different glues results in the greatest binding strength. Although they are not of interest in the current investigation, other factors thought to affect binding strength are the number of pages in the book and whether the book is being bound as a paperback or a hardback.
 - a. What is the response variable in this experiment?
 - b. What explanatory variable will determine the experimental conditions?
 - c. What two extraneous variables are mentioned in the problem description? Are there other extraneous variables that should be considered?
- 3) A study of college students showed a temporary gain of up to 9 IQ points after listening to a Mozart piano sonata. This conclusion, dubbed the Mozart effect, has since been criticized by a number of researchers who have been unable to confirm the result in similar studies. Suppose that you wanted to see whether there is a Mozart effect for students at your school.
 - a. Describe how you might design an experiment for this purpose.
 - b. Does your experimental design include direct control of any extraneous variables? Explain.
 - c. Does your experimental design use blocking? Explain why you did or did not include blocking in your design.
 - d. What role does random assignment play in your design?
- 4) The following is from an article titled "After the Workout, Got Chocolate Milk? That appeared in the Chicago Tribune:

Researchers at Indiana University at Bloomington have found that chocolate milk effectively helps athletes recover from an intense workout. They had nine cyclists bike, rest four hours, then bike again, three separate times. After each workout, the cyclists downed chocolate milk or energy drinks Gatorade or Endurox (two to three glasses per hour); then, in the second workout of each set, they cycled to exhaustion. When they

drank chocolate milk, the amount of time they could cycle until they were exhausted was similar to when they drank Gatorade and longer than when they drank Endurox.

The article is not explicit about this, but in order for this to have been a well-designed experiment, it must have incorporated random assignment. Briefly explain where the researcher would have needed to use random assign in order for the conclusion of the experiment to be valid.

- 5) In many digital environments, users are allowed to choose how they are represented visually online. Does how people are represented online affect online behavior? This question was examined by the authors of the paper “The Proteus Effect: The Effect of Transformed Self-Representation on Behavior”. Participants were randomly assigned either an attractive avatar (a graphical image that represents a person) to represent them or an unattractive avatar.
 - a. The researchers concluded that when interacting with a person of the opposite gender in an online virtual environment, those assigned an attractive avatar moved significantly closer to the other person than those who had been assigned an unattractive avatar. This difference was attributed to the attractiveness of the avatar. Explain why the researchers would not have been able to reach this conclusion if participants had been allowed to choose one of the two avatars (attractive, unattractive) to represent them online.
 - b. Construct a diagram to represent the underlying structure of this experiment.